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HIGH SCHOOLS.

BY PROF. JOSEPH A. REES.

THE evolution of pedagogic thought, as exhibited by the development of empirical practices into systems and by other transitional movements along the educational line in Utah, are strong evidences of the character of her people. Especially gratifying is the present condition of school affairs. When it is remembered that the present school system has been in operation but a few years, and that the people of the Territory have from the beginning maintained schools at their own expense without other assistance whatever, the reason for this gratulation becomes apparent.

Long before the present school system was established, and indeed from the earliest history of the people in these valleys, the education of the young was placed and kept in the foreground of imperative importance. Wherever a few families settled, the first important step after the humble homes were built was the erection of a schoolhouse. Into this nucleus gathered the cheery faces of long ago. Here in ill-ventilated, dark, dingy, and poorly provided rooms, mixed classes received much inefficient instruction. Yet, with all the drawbacks of the period, much good was accomplished. With all the imperfections of the past, its yeoman service piloted many a youth into the haven of strong, self-reliant manhood, and many there are of those who today form an essential part of the brain and brawn of the commonwealth.

The people who then lived were actors. They were filled with high hopes and aspirations. They contended that enlightenment and freedom are inseparable, and to possess and enjoy true liberty the mind must be filled with clear conceptions of the purest ideals, the heart made responsive to the most delicate impressions of right and wrong, and the will trained to exact execution. They were psychologists in fact. It was this people, isolated in the wilderness, who established the University of Deseret (now Utah), and who conceived then the idea that the poorest child in the land should be aided in his efforts to move along an uninterrupted

plane from the chart class and through the university as though he were a Cræsus. And that the state might grow in power and maintain its renowned constitutional loyalty, they declared in favor of public common schools where the children of all nationalities could intermingle and assimilate and become one in their devotion to the republic, one in their love for its palladium.

With these objects in view there evolved out of the primitive facilities and methods of yore a system enacted into law conferring upon all the children of the Territory the boon of elementary instruction, including what is now known as the Eighth Grade, and a somewhat vague and indefinite privilege under unknown conditions to attend a high school.

That enactment—though not perfect—gave a new birth to educational efforts. A new era had actually dawned. Everywhere better school-houses were built, facilities were increased, accommodations multiplied, new and better methods presented, and a professional spirit brooded over all. No longer was the "birch" ruthlessly peeled to enforce obedience. The master had made room for the teacher.

As the new developed into shape and symmetry, its influence became stronger, its results more and more appreciated, and now Utah has the proud distinction of being in the front rank of the great educational movement of the age.

The public schools where professional teachers have been employed have produced excellent results. Thousands of both sexes have climbed to the topmost round of the grammar course, but, alas, the majority of them could go no further for want of opportunity. In most cases their parents are too poor to provide sufficient means to pay their expenses at school from home, and the idea of their children living in a large city, with its many temptations and allurements, is not a consoling one.

These circumstances led certain school districts to provide a higher grade of instruction at home, and for that purpose established high schools.

It was in 1893 that the good people of Spanish Fork formally and unanimously decided that the elementary course was not sufficient in itself to impart that kind of knowledge nor give that class of training that should enable the youth to cope successfully with the possibilities of life.

The results of the Spanish Fork high school up to the present have met the anticipation of its promoters, although with different and better arrangements, more suitable educational appliances and necessary apparatus, the work would have been more complete, the course more rounded. Notwithstanding the disadvantages encount-

ered from the beginning, the present achievements are a prophecy of a more successful future, a future full of hope and promise, especially if the new state in its magnanimity and wisdom shall provide for instruction free to all the youth up to and including the University.

The studies pursued in the high school, although closely related to the grammar course, properly form no part of it. Indeed the period of high school life is distinct, and the line of demarkation a real one, based upon psychological courses that are recognized in the arrangement of every course of study.

The studies pursued are algebra, physics, physical geography, domestic science, civil government, composition, general history, orthography, and book-keeping.

Children under eighteen years of age and belonging to the district are admitted free; those over eighteen pay the nominal sum of two dollars a term.

The first year thirteen was the full enrollment, this year thirty, with a fair prospect of increasing the number to fifty by the commencement of another school year.

It needs no figures to convince even the thoughtless of the practical advantages of a high school, including the bridging of the gap between the grammar department and the University. All will agree that the object of education is a preparation for life, to discipline the child for its effects upon him to the end that he may exercise effectively all the powers of his being, according to the laws of life, and thereby be of the greatest good to himself and others.

The aim of the common school is hardly so pretentious, nor could it be. The child of ordinary ability should complete the common course at fifteen. Has he then received such incentives as will enable him to further his investigations unaided? Has he acquired such momentum that his future growth will steadily tend towards complete manhood? His past studies have not been of that nature. His is a new epoch now. Fresh motives stir his soul. He demands a new environment—one adapted to his growing energies, to the ideal impulses of his soul. He will soon become a citizen, a husband, a father. What kind? He will either pour blessings, exhale blightings, or be a ninny. Which? His future depends largely upon the voice of the people. If they stunt his growth he may become gnarled and crooked. If they encourage his growth and training he is likely to repay the state a hundredfold.

Is it not, therefore, the duty of the state clearly to provide by appropriate legislation ample means to enable every child in

the land to become fully armed and equipped with well trained powers of heart and soul that will glorify her escutcheon and make her prouder and better because of him? What is wanted is men, trained men, and such men can be better had if given opportunity at the right time. Let the state provide. Let her so ordain that no aristocracy of brain can be possible; let her lift the hut to a level with the mansion and education be free up to and through the university.

The high school is the connecting link between the common schools and the university. Sever them and you have left disconnected fragments, neither of which taken alone meets the demands of the age; but with the trinity as a unity an educational system of proud dimensions will forever shed beams of glorified brightness along the furrows of the future.

THE NEED OF TECHNICAL EDUCATION.

BY JOSEPH JENSON.

The environments of any community influence very largely its occupations, habits, customs, even its life. One river, one alluvial plain, one great desert were important factors in determining for the inhabitants of the valley of the Nile a monotheistic religion and a monarchical form of government. Grassy slopes produce a pastoral community; rich plains develop an agricultural people; foaming rivers are bordered with manufacturing towns and cities; a good harbor attracts to its shores a seafaring race.

Utah furnishes facilities so ample and varied that it would indeed be difficult to determine just what special industry would best flourish among her inhabitants. Still, Utah has certain marked features which ought to and will specialize to a very considerable extent the occupation of a very large portion of her population. Among these, her mineral and water-power resources are prominent. She affords the most generous opportunities for manufacturing pursuits, and it is very fair to assume that in the near future the buzz of the machine shop and the hum of the spindle, will be as common in Utah as they now are in New England.

Her educational system then must incorporate provisions for the acquisition of such knowledge as will fit her sons and daughters for the various pursuits which these conditions will afford. Not only to qualify them as expert manufacturers or producers, or to prepare them for the positions of foremen or superintendents but to fit them as practical designers and originators. That is, to meet these conditions and derive from them the greatest benefit, she

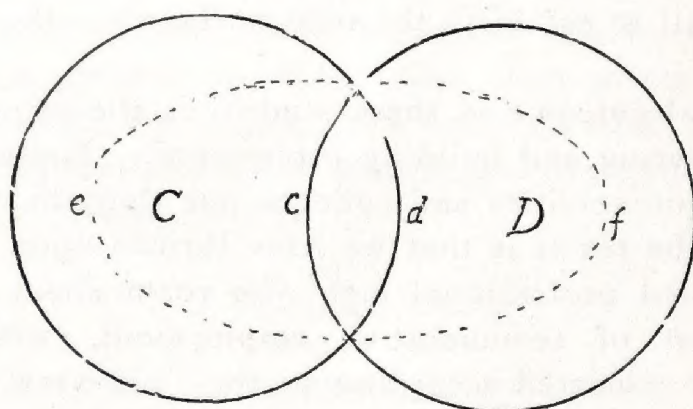
needs to introduce into her higher education "technical instruction" or "technical education," understanding that term to mean the ability to apply in the industrial arts and sciences the theory which is derived from a study of Mathematics and the Physical Sciences. The idea prevalent among certain classes in our Territory that these subjects are essentially disciplinary in their value (when properly followed out) is a sad mistake. The fault is that we either do not pursue these subjects far enough to be able to use them, or we fail to establish the relation between the theory and its application.

The logical outcome of these studies is the acquisition of the various engineering and building professions. These subjects are taught in our universities and colleges but they do not fill the requirement. The result is that we have thrown upon the country a class of so-called professional men who roam about from place to place, in quest of remunerative employment, without success. These men are educated according to the "old view" that "If the brain is thoroughly trained the hands will take care of themselves." In accordance with this view were established the early Polytechnic schools in western Europe; but instead of thus affording opportunity for graduates in the industrial arts, in Germany in 1881 there was an excess of one thousand "well trained" Polytechnic students over the demand; and it is reported that one manager of a large engineering firm who had advertised for professional men had been so importuned by these young men for employment that he put up in his window, "No Polytechnic student need apply." At the same time, graduates from the Imperial Institute of Technology at St. Petersburg were in high demand and were accepting most responsible positions even in Germany as engineers, mill builders, architects, chemists, etc. The German Polytechnic schools at the same time afforded accommodation for six thousand students while the total attendance was little more than two thousand. The annual cost to the state per student was five hundred dollars exclusive of interest, yet even in the face of these conditions the Baron von Eybsfeld, Austrian minister of Instruction, is quoted as saying that the most serious problem in education in that country is to reduce the number of theoretical engineers who, after a long course of study, find themselves not wanted and to *increase* the number of men in whose training theory and practice have been so combined that they can meet the *great demand* for those who can put theory and practice together.

The United States has lately developed some schools for the purpose of supplying this long felt want and *some* efficient work is

being done in these schools; among these schools the Massachusetts Institute of Technology is taking the leading part, and others are following close in its footsteps. All of these schools are located in the East. Utah and the West are still deficient in this respect.

We have among us two classes of professional engineers either of which has but little ground in common with the other. Their relative positions may best be illustrated by the following figures:



The circle C represents the university trained engineer. He has completed his course in theoretic engineering, has passed a rigid examination in the deduction of formulæ and solved numerous technical problems of special cases. He is a mathematical gymnast. He may perchance, relate the history of the Brooklyn bridge or the Suez canal. He will state exactly what will be the strain of any particular fiber of a loaded beam, provided all other conditions such as the dimensions of beam, points of application of load, manner of loading, manner of support, etc., be given. But if he be given simply the condition to be fulfilled *i. e.*, the function of the beam, to provide dimensions of beam, manner of support, most probable limits of distribution and intensity of load, etc., in order to effect the most economic solution of the problem, he sees before him an impenetrable sphere and he seeks in vain for some opening by which he can get inside, for he can work only from the center out; the other direction is to him a dark path.

Circle B represents the education of the shop or field trained engineer. He understands the manipulation of instruments, machinery and mechanical devices. He has learned according to the parrot fashion to substitute certain data obtained by him into certain formulae obtained by some dealer in the black art, for aught he knows, and he obtains from the combination something which he uses for the basis of his construction. This he considers absolute fact. His hand book is his authority and that authority often renders such an organ as a brain a superfluity. If he has by chance obtained Unwin's hand book, Unwin's dictum is infallible;

if Trautwine's book happens to be at hand, that supersedes all other dictums.

Following are a few figures from standard authorities on the strength of materials: The mean fiber stress which causes rupture in a spruce beam in pounds per square inch is given by Halfield as 9,900; by Rankine as 11,100; by Laslett as 9,045; by Rodman as 6,168. For yellow pine beams it is given by Halfield as 15,300; by Laslett as 12,254, by Trautwine as 9,000; and by Rodman as 9,293. Actual tests made by the government of the United States and in the laboratories of representative Technical schools, show that by taking the mean of several hundred tests of full sized building beams that a fiber stress of over 3,000 lbs. per square inch in spruce or white pine and over 5,000 lbs. per square inch in yellow pine is dangerous. It will be observed that these "authorities" not only differ among themselves by nearly 100 per cent. but that they all give figures far above the figures obtained from actual tests and full sized pieces.

I think no argument is necessary to convince any intelligent person that neither of the two classes of engineers above referred to are incompetent. These two classes have in common the idea that each is itself the ideal class of engineers and that the other is naught but subterfuge. This common ground may be represented in the figure by the common segment a, b, c, d. To say that competent professional men *cannot* come from either of these classes would be to state a stupid absurdity; but the rule is as has been above stated.

The education of the competent engineer may be represented by the dotted ellipse e, a, f, b, which has for its foci the centers of the circles C and D and for its minor axis the common chord a, b.

The nearest approach to the acquisition of such an education is obtained according to the Russian system or "new views" of technical training as represented in the Imperial Institute of Technology at St. Petersburg. About fifty or sixty years ago, when Russia began to develop her internal resources in a scientific manner, she sent commissioners throughout all parts of Europe to study the various systems of technological education. The result was the establishment of technological schools which surpass in equipment and affluence of resources any in the other countries, perhaps even the Ecole Polytechnique at Paris. This desirable result was affected by the skillful co-operation of shop work with the theoretic training. The praise of the world is now bestowed upon Russia for this innovation in the old system of purely theoretic training.

Remembering the extreme modesty of Englishmen in regard to such matters, the following quotation from a report of the British Royal Commissioners on Technical Education after their examination of technical schools in Europe will be significant: "The Russians alone among European nations are entitled to the credit of attempting to reform the technical training of engineers and mechanics by mixing workshop instruction with other elements of the polytechnic course. Their success is remarkable. It adds great force to Russian examples and precedents to know why the polytechnic schools there are of such excellence."

Let us now take a brief review of some of the distinguishing features of the Russian system as carried out in the Imperial Institute, e. g: In the laboratories of applied chemistry are a distillery with a capacity of one thousand gallons of alcohol per day; a dye-house, where the dyer handles one hundred pounds of woolen, silk and cotton goods a day; soda works, which yield one thousand pounds of soda ash each day; a complete iron working plant consisting of blast furnaces, puddling irons, Bessemer plant and foundry, where several tons of iron are handled daily.

The student who would graduate in chemistry at the end of his five years' course, must take complete charge of each of these manufacturing plants in turn, buy raw material, subject each step in the manufacturing process to test conditions and account to the professor in charge for everything. The mechanics and engineers enter a shop where they learn pattern making in the wood room, casting in the foundry, forging in the smithy and metal making in the machine shop.

The following which is condensed from the complete schedule of hours will show about the relative stress which is placed upon shop work in that institution:

Time of each student spent with the professors while receiving instruction in Mathematics, Languages, Drawing, Theoretical sciences, etc., during the five years, 3,296 hours. Time spent by mechanics in shops and by chemists in laboratories of applied chemistry, 2,700 hours; total 5,996 hours or practically 6,000 hours. This, it will be observed is about fifty per cent. above the number of hours in the average university course; yet notwithstanding nearly all of this shop or laboratory work has been added to the university curriculum, at the end of the course the technology student is in every way the physical and mental equal of the university student, with the possible exception that he has not made a record as center rush on the "Varsity foot-ball team." He shares every honor as an educated man with the university graduate and has

the additional advantage that the industrial world stands with open arms to welcome him to an honorable and remunerative occupation.

THE CULTIVATION OF THE MEMORY.

B. CLUFF, JR., M. S.

II.

IF a child sees an apple or other interesting object, he reaches for it; if he hears a sound, he turns to it; if he touches an object, a contraction of the fingers or a withdrawal of the hand immediately follows. There is a nerve path from the eye to the muscles of the arm, from the ear to the muscles that operate the head or the body, and from the extremities of the hand to the muscles of the arm. By following carefully the case of the child seeing the apple, one finds that rays of light coming from the apple enter the eye and in some way set in motion nerve currents, which flow through the optic nerve into the brain and are there mysteriously turned into nerves that terminate in the muscles of the arm, causing at the terminations such contractions as are necessary to extend that member. But somewhere along this path, consciousness, or the psychic element as it may be called, enters: the child becomes consciously aware of the apple. And somewhere in this psychic element, association takes place and with it memory, for the child recalls other apples, or, perhaps, the taste of the apple, its color, etc.

Now it will readily be seen that all nerve tracts, however complicated they may be, are reducible to these simple ones, namely, there is a definite beginning, a course, and a definite end. The brain-path theory asserts that nerve currents passing through the brain make paths, each of which corresponds to an idea, and each having its definite course, its connection and its characteristic settings. The recall of an idea is the reflow of nerve-currents through a former path, and the characteristic settings is the peculiar something by which the recognition is made. Association of ideas are connected paths leading from this one in all directions into which part of the current is made to flow, and the more numerous these connecting paths the more numerous the ideas associated. Attention is the power by which the currents are directed in their course, and inhibition the power that cuts off or dams up the flow. In brief, then, the brain-path theory conceives the brain as being perforated in all directions by paths (each path corresponding to an idea) through which nerve currents flow.

When slumbering, these paths are the condition of retention; when active, they are the condition of recollection or recall.

It is easy on this theory to conceive the conditions of good memory, and also easy to prescribe methods of memory culture. Mr. James has the following: "Memory being thus altogether conditioned on brain-paths, its excellence in a given individual will depend partly on the *number* and partly on the *persistence* of these paths." The persistence or permanence of these paths, according to Mr. James, is a physiological property of the brain tissue of the individual; that is, it depends upon the quality of the brain, and just as people differ in the quality of their muscles, so they differ in the qualities of their brains. Some are like wax, others like jelly. The former receives an impression and keeps it, while the latter vibrates to every touch, but retains no permanent mark.

As brains differ in individuals, so do they differ in the same individual in different periods of life. In youth they are soft and plastic, and paths are easily made; in middle age the plasticity is gone but the tenacity has improved, while in old age both have degenerated, and a fact is scarcely held while being repeated. The number of paths—associated ideas—is due altogether to the education or mental experience of the individual, and the method pursued in obtaining this mental experience.

The student who pursues logically and systematically his studies, who associates only such ideas as are intrinsically connected, will have good power of recall. His mind will be like a well-arranged library in which any particular book may be obtained without hesitation; every idea will be in its proper place and have its proper connections. On the other hand the desultory student makes improper associations of ideas, and when the time of recall comes, a heterogeneous mass is poured forth. There is neither logic nor system in what he says.

A good memory, then, depends much on methods of study, the way facts are arranged in the mind, and is therefore a matter of slow growth. Often one must go back and relearn things wrongly learned. He must undo former associations and make new ones. He must form new brain-paths and proper connections. Such a person would receive but little assistance from systems of memory-culture like that of Loissette or any of the mnemonic or mechanical systems, for these are based on artificial methods of association. They simply form connecting paths from familiar to unfamiliar ones, so that a current from the former will flow into the latter without regard to their intrinsic connection. Ready memories along certain lines may thus sometimes be made, but scientific minds

never. The benefit derived will never be permanent. What the weak memory needs is a close analytic drill in the methods of analysis and synthesis, so that when a subject is touched all ideas properly related to it will flow logically into consciousness.

The more ideas thus properly associated the stronger will be the memory, or in the words of Mr. James, "The more facts a given fact is associated with, the easier will be its recall;" or physiologically, the more paths a given path has leading to it, the more likely is a current to flow through it.

It is well known that in memory attention plays an important part. The more attention put upon a thought, the better the memory of that thought. In the brain-path theory this is easily explained. Attention controls the amount of the current. The more attention the greater the current, and hence the deeper and more permanent will be the path. If the brain be likened to a tree, and the nerve current to an ax, then attention would be the force in the arm that swings the ax. The greater the force, the deeper the ax will enter the wood and the more lasting will be the scar. Attention, then, aids on the side of presistence rather than on that of association.

Repetition tends also to facilitate recall. Here though the current may be weak, its being oft repeated tends to deepen the path or to keep it open. Many weak currents tend to the same result as one strong one, just as many light strokes of the hammer will drive a nail as deeply as one or two heavy blows. Repetition, however, may easily degenerate into mere reflection of the nerve centres; it may lose its psychic element, just as one may read a page and think of something else, so that to resort to repetition alone is not only not good but positively harmful. The so-called "cramming" in study is merely learning by repetition, and, though it is permissible at times, is mostly always injurious.

Herein lies a strong argument against the practice of some schools in laying such stress on final examination as a means of promotion or graduation. Where all depends upon the final test students resort to any means that will aid them in getting through, and as "cramming" presents itself as the easiest, cramming is resorted to. Better by far let the final promotion depend as much on the daily recitations as upon examinations, for this alone insures good work during the whole year.

To sum up, then, a good memory is in part a matter of inheritance, but mostly the result of education. We inherit the quality of our brains and nerves. This cannot be changed. But we fashion and arrange the paths corresponding to ideas by education and study. To a good memory, then, deep, logical study is essen-

tial. Not only that study which pours over books, but that which reflects on what one has read.

The laws of association and those of the brain will be considered next.

EDITORIALS.

EDUCATION IN THE CONSTITUTION.

ONE of the difficulties in the way of constitution-making is the need of drawing a distinct line between legislating and setting down basic principles of state policy in unequivocal terms. Where this line is loosely drawn constitutions swell to the bigness of entire volumes, as is the case in many of the recent states. Where provisions are multiplied and attempts made to cover every possible case, one is tempted to believe that conventions act upon the assumption that the intelligence of future citizens cannot be trusted. They not only plant the tree of state but erect an artificial scaffold to protect its growth for all time to come, and determine just where every limb and branch and twig and leaf shall sprout and how it shall develop. Though neither prophets nor the sons of prophets, such constitution-makers, with the sublime audacity of omniscience, would, if they could, tie up the destinies of unborn generations.

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But they cannot do it. Legislative constitutions get out of date. Then at great expense the antique scaffolding must be torn down and forced growths be lopped off. Our own convention evidently takes this view of the case—at least when acting as committee of the whole—if one may judge by the merciless pruning which long and verbose committee reports get before being incorporated in the constitution.

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But it is our purpose to note here only the work of the educational committee. With the usual willingness of constitution-makers to give posterity the benefit of their superior wisdom, the majority of this committee presented a scheme of education as logical and beautiful and complete as Lock's Constitution for the Carolinas. Here were divisions and sub-divisions, provisions and counter-provisions, embracing most of the relationships of school from the kindergarten to the university. The minority, which was a very small one, protested against all this elaborateness, and offered some amendments which were quite ignored.

The only satisfaction left to this minority was to prophesy disaster for the measure when it should come before the committee of the whole.

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The prophecy was fulfilled. The judgment of the minority was vindicated. The disaster came. The measure was returned with instructions to boil it down. But before this was done, it had been so amended as to include the vital ideas of this same minority; all which must lead to the conviction that majorities are not always infallible.

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Teachers may be interested to know who headed this minority. It gives us no little pleasure to say that it was that grand old war-horse of education, Dr. Karl G. Maeser, ably seconded by Abel J. Evans. The Doctor contended that all secondary schools should be creatures of the legislature; that the exigencies arising out of the changing conditions in the wealth and population of an undeveloped state, rendered it impossible to fix once for all the status of high schools and similar institutions; that sufficient constitutional guarantee is secured if legislatures be given full liberty to act as they may see fit with reference to secondary education.

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But this was not true as to the public schools, including the eight grades. No free state could long exist without these as a foundation. These were pre-eminently the schools of the people. Thousands might avail themselves of higher education, but millions would be the number educated in the lower schools. The convention agreed with the Doctor in these views. So numerous and far-reaching were the amendments as to leave very little of the original article. It is thought that the committee will report a substitute. The nature of the new article remains to be seen.

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It was with no little chagrin that Dr. Maeser's colleagues accepted the result. Hitherto the venerable educator had hardly been listened to in the deliberations of the committee. His conservative policy did not chime with their extravagant notions, and he felt by no means complimented by their want of consideration for his ripper experience. But he bided his time. "Wait till the measure gets before the committee of the whole," said he significantly to a friend. "We shall then see whose views are the more correct." Nor was he mistaken. After the amendments of the minority had been fully discussed, the convention almost to a man honored his judgment by a rising vote, and left his late colleagues sitting.

When the skirmish was over some of these, notably Commissioner T. B. Lewis, did not scruple to charge him to his face with opposition to high schools and with basing his action for the advantage of Church schools. This charge Dr. Maeser indignantly denied: "I wish you to understand," said he, "that in my capacity as member of this convention I know no interests, private or otherwise, aside from those of my constituents. In this educational fight I have acted conscientiously for the good of the state. As to high schools, and the how, when, and where they should be established—that these are questions which only a legislature can properly deal with must, I submit, appeal to the native common-sense of every unbiased citizen."

And we think so, too.

At the meeting of the county superintendents, held in Salt Lake City on April 6th last, the report of the committee appointed at a previous meeting to prepare a high school course was presented. The report provided, as we have before stated, for a three years' course. The question of making it four years was again brought up and after some discussion carried, with the understanding that those counties not able to do the full work might take as much of it as they could,—one year, or two, or three. This change and provision have our hearty support; for, in the first place, it makes the Utah high schools equal, at least in length of course, to any in the United States, except a few Harvard preparatory schools in Massachusetts that offer a five years' course; and second, as the high school is pre-eminently the poor man's college, as it prepares for life more than for university work, the four years' course is in the interest of the poor student.

The high school department in the Brigham Young Academy, soon to be organized, will cover four years' work, and will offer two courses, one preparing for the Normal college, the other preparing for any of the leading universities in the United States.

The Brigham Young Academy will conduct two summer schools during the coming season; one, beginning June 3rd, and continuing three weeks, to be followed by a Joint County Teachers' Institute of one week, will be held at Fort Cameron, Beaver; the other will be held in Provo, and will open about July 16th. Both will give the academic and professional instructions needed by teachers in the primary and grammar grades, as well as higher academic courses, and both will conduct a complete training school. Circulars will soon be out announcing courses.

THEORY AND PRACTICE OF TEACHING.

COMMON FRACTIONS.

BY O. W. ANDELIN, B. PD.

III.

No serious trouble will be met in teaching addition or subtraction of fractions if pupils are grounded in the truth that a fraction consists of but one number and not two. How can they get any other conception unless it be taught them? Take in one hand three sticks of chalk, in the other three-fourths of a stick ($\frac{3}{4}$). How many objects in my right hand? Three. How many in my left? Three. The latter are smaller, that is all the difference. The fraction $\frac{3}{4}$ is not "3" and "4;" it is simply the expression of three somethings, three parts, three-fourths, and therefore has but the one number, "3."

As soon as the sum of two or more fractions equals one, or more than one, another process is involved. The value of the answer must be expressed in terms of whole numbers. Some teachers make this question seem very difficult. They spend much valuable time trying to initiate pupils into the mysteries of "reducing improper fractions to whole or mixed numbers." (I do not like the word reduce, hence the quotation marks. When we speak of reducing a man's wages, he knows at once that they are to be diminished in value, which is not the case in "reducing" fractions. Use the word change instead, or, express the value of $\frac{8}{4}$ in terms of whole units.) It is time wasted. Pupils know how to express the value of an improper fraction in whole numbers already. Try it and see. How many ones in $\frac{4}{4}$? in $\frac{8}{4}$? in $\frac{16}{4}$? How many ones in $\frac{10}{5}$? $\frac{25}{5}$? $\frac{80}{5}$? What is the value of $\frac{7}{7}$? of $\frac{21}{7}$? of $\frac{49}{7}$? Pupils will answer these correctly without hesitation.

I examined some work in numbers in the Fourth Grade and was struck with the skill of the pupils. It was in addition of dissimilar fractions, and whenever the result equaled a whole unit, the pupil had so expressed it, without any instruction from the teacher, too. For instance, in one case the sum was $\frac{28}{28}$, and the pupil's answer was " $\frac{28}{28}$ or 1." In another example the sum was $\frac{32}{30}$, the pupil's answer being " $\frac{32}{30}$ or 1 $\frac{2}{30}$." The teacher assured me that she had said nothing to them upon the subject.

We often make the mistake of trying to make tuition take the place of intuition. The mind comprehends many things without instruction. Pupils in most cases need only the question, and not the instructions that accompany it. If you ask what the value of $\frac{24}{4}$ is, the pupils will answer 6. Let not the teacher make the

mistake of explaining it; let the class do it. Why does $\frac{24}{4}=6$? Because $\frac{4}{4}=1$, and $\frac{24}{4}$ is six times $\frac{4}{4}$. Any pupil will give that answer, or one just as good.

It takes a mind perverted by incorrect teaching to do what the following rule (?) says: "Divide the numerator by the denominator, and if there be a remainder, write it over the denominator." No pupil will proceed in such an outlandish manner, if left to his own intuitions. How can the numerator be divided by the denominator? It is the name of a number, but it is not itself a number. Work this: $36 \div \text{Peter} = ?$ The following is equally absurd: What is the value of $\frac{248}{8}$? Solution:

$$\begin{array}{r} 248 \\ 8 \overline{) 248} \\ \underline{31} \end{array} \text{ Answer.}$$

This solution cannot be analyzed, neither can it be explained. A symbol, to be of any value, must remain the same. The denominator cannot be both a number and a name. By making it the divisor, it is presumed to be a number. A thing either is or is not. Suppose the symbol "table" meant both a table and a chair and a coffee-pot. How should we know which was referred to? The denominator $\overline{8}$ is the symbol for eighths; it tells the kind of 248 things we have, and while it is acting in that capacity it can hold no other office. Hence there is confusion when teachers have pupils adopt the above method of solution. The 248 taken apart from the denominator stands for 248 ones. Thus the proposition becomes, How many eighths in 248 ones? There are 1984 eighths. If you contend that 248 is not 248 ones, but $\frac{248}{8}$, then the proposition becomes, How many eighths in $\frac{248}{8}$? There are 248 eighths, of course. The divisor is not *eighths*, but *eight*, you protest. Granted, the proposition becomes, How many eights in $\frac{248}{8}$? Since it takes $\frac{64}{8}$ to make eight ones, there are $3\frac{7}{8}$ eights in $\frac{248}{8}$. No, no. You insist that the divisor is 8 and the dividend 248. In 248 there are 31 eights.

I forbear continuing this further. The question is not to see how many eights there are in 248, but to see how many ones there are in $\frac{248}{8}$. If the pupils are not able to determine the answer by inspection i. e., $\frac{248}{8} = 31$, let the work be about as follows: $\frac{248}{8} = ?$ $\frac{248}{8} \div \frac{8}{8} = 31 \frac{8}{8}$, or 31 ones. Give a short drill in expressing the value of improper fractions every day until pupils become quick and thorough. Those examples which are too hard to be worked mentally can be worked similarly to examples in division of integers.

Ex. $\frac{216}{18} = ?$ Solution: $\frac{216}{18} \div \frac{18}{18} = 12 (\frac{18}{18})$, or 12 ones.

The twelve may be found by taking the numerators out and dividing as below:

$$\begin{array}{r} 18 \overline{) 216} \quad (12 \\ \underline{36} \\ 36 \end{array}$$

By thus pursuing a rational method the dark clouds suspended in the fractional sky will melt away, the light of day and of reason will take their place, and students will not be compelled to make the lamentable remark that they have "gone over" fractions three or four times and still do not understand them. Let the light of reason appear.

NOTES ON TEACHING.

OBSERVE the nature and propensities of your children, in order to be able to educate them according to their individual wants and talents.

Instead of giving or pumping knowledge into pupils, and showing them what and how to do, they should be encouraged to stride out for themselves, to find out new truths and new ways of doing a thing, and unassisted to solve problems that lie within their powers. There is too much guiding, helping, and supporting in the schools and too little self-activity. Character is self-reliance, and the only way to form it is by self-activity. Diesterweg expressed it: "Lead your pupils to self-reliance through self-activity in the service of the true, the beautiful, and the good." These are golden words, and should be written on every teacher's desk.

Many teachers seem to forget that the different branches of instruction are closely connected with one another. When number is taught, for instance, all is sacrificed for the sake of getting correct solutions of the problems. That the language is clear and correct and the figures well written does not trouble them much if at all. "We have arithmetic now," they say, "expression we teach in grammar and composition, and penmanship in the writing lessons." Then the examples are all about dollars and cents, weights, measures. How easily might that which the children have learned in history, geography, natural history, etc., be recalled and refreshed by using it in the number lessons! That would bring connection into the branches of learning. The mind of the child is not a mass of pigeon-holes, one for language, another for arithmetic, a third for chemistry, etc.; it is one whole. Unconnected knowledge is soon lost again; it divides mental effort instead of unifying it. "In union is strength," is an adage that also applies to knowledge and the upbuilding of the mind.

The steady advance of the study of psychology in normal

schools, summer schools, and training schools is a feature well worth noting. When it was first undertaken there were those who decided it was an "educational fad" that would have its day and then disappear as others have done. It was said that a "girl could teach arithmetic just as well without psychology, and it would be a better use of her time to study algebra or geometry. But the same argument had been made in turn about these studies—as having no bearing on primary teaching. This steady persistence in the study of psychology is a phenomenon well worth noting.

The object of a class recitation is three-fold: first, to ascertain how much right thinking the pupil has done since the last recitation; second, to direct him in the search for truth by correcting his errors and pointing out the right road for him to travel in; and third, to give him inspiration in his work so that he may be led to love the truth and to search for it with all his soul.

The object of an examination is to find out how much the pupil knows how well he can use his mental powers, in short what progress he is making in his educational work.

A true recitation is in no sense an examination; in fact, it is so different from it that the two cannot be united in one exercise. The teacher who understands his business will be careful not to mix the two, and so cause confusion and discouragement.

The importance of having a well-defined purpose is evident if we consider that where there is no aim there can be no plan. Where there is a plan—even if the work is only manual—there are neatness, regularity, and dispatch. More is always done, and better done, with a plan than without one. Without a plan in school work, considered in relation to what has to be accomplished in the entire school life of the child, there come to be waste of time, misdirected energies, useless repetitions, and roundabout ways.

At the meeting of the County Superintendents held in Salt Lake City, the teachers were urged to attend the National Association at Denver, and it appears that quite a large number will respond to the call. The agent of the U. P. Railroad system explained the accommodations to be offered by that road, saying that trains would be run from Ogden, Salt Lake, and Provo; reaching Denver in twenty hours. Pullman cars, chair cars, and tourists' sleepers together with all necessary accommodations will be on each train. The teachers going over the U. P. will have the choice of routes returning. After this explanation a vote was taken, and it was unanimously decided to make the U. P. system the official route.

PRIMARY METHODS.

NATURE STUDY FOR SPRING MONTHS.

BY WALTER M. WOLFE, B. A.

It is not a decade since all those branches of science which are today grouped under the title "Nature study" were advocated solely from the utilitarian standpoint. As a factor in mental development they had not been considered. The school garden then had no psychological value. It was in the eyes of many trustees and parents a bit of aesthetic foolishness on the part of a lazy teacher who might have employed his time to better advantage in multiplication table drill. Even the annual report of the Commissioner of Education for 1885-6, in quoting papers read before the National Educational Association, takes no broader view of the studies of botany and geology than the making of better farmers out of country students. The following extract from an essay recently read by Rev. E. P. Powell before a farmers' institute at Clinton, N. Y., fairly presents one side of the question:

"And here we are met by the fact that American education was never intended for the agriculturist. It grew out of European education and took its shape from old mediaeval notions. It put geography, grammar, and arithmetic to the front, just as a little higher up it placed Latin, Greek, and rhetoric. Now on the land we have to deal with something those studies do not touch. We are consumed with bugs and blights and droughts; we deal with trees and plants, with flowers and fruits and vegetable life in general, with animals and soils, with rocks and water courses. What we want taught to our children is not the geography of India or even Indiana; but a knowledge of the things under their feet and all about them.

"They should begin with geology, a knowledge of the soils; and chemistry, a knowledge of waters and minerals. Entomology, botany and zoology are farm studies, and if our young folks can have these they can get not only a living off the land, but will be so much at home on the soil that you cannot induce them to leave it. This will come. We shall see our common schools readjusted so they will stand in gardens, and half of each day will be given to the study of things and the other half to books."

The lecturer is right when he remarks that American education was never intended for the agriculturist. Neither was it intended for the merchant, nor for the surveyor. It is intended for the development of the man and woman, not for mere training in this line or in that. Child development is no longer a physical but a psychological problem, and nature study is a means in the developing process.

The second subject for our consideration is birds. Just as the suggestion of bird study came naturally, so the sparrow flying through the school window, the nest under the eaves, or the first

song in the leafless trees introduces another chapter in observation work. Talks on migration are most interesting and important aids to geography study. Habit and home-making will afford opportunity for original research. Adaptation for special purpose (the woodpecker's toes and tongue, *et al.*) opens the field of instinct and environment and affords the child opportunity to reason as well as to observe.

There is something in the study of birds that develops the altruistic emotions. The child who learns to love birds is never guilty of stoning them or of robbing nests. It naturally follows that he is kind to associates and polite to his elders. And while we are on this subject I want to speak a word about dissection. In advanced classes in zoology, biology, and physiology vivisection may be, and without doubt is, legitimate, but in a primary school I would never vivisect nor would I have the teacher kill a butterfly, much less a bird, in the presence of the pupil. If you wish to pluck the plumage or examine the digestive organs, kill the specimen at home and arouse in the pupil both an emotion of pity and a respect for the sacredness of life, before one step is taken toward the use of the knife.

The literature of bird life is vastly greater than is that of either buds or butterflies. It is the literature of both the poet and the artist. In addition to the nature classics of Burroughs, Thoreau and Muir, that should be in every teacher's library, I want to call especial attention to the following charming studies from the pen of Olive Thorne Miller: "Bird Ways," "In Nesting Time," "Little Brothers of the Air," "A Bird-Lover in the West." Mr. Bradford Torrey writes in a happy and sympathetic strain, and his three works, "A Rambler's Lease," "Birds in the Bush," "The Foot-Path Way," are of both scientific and literary value. However, if I could have but one literary classic to use in connection with my nature study it would be Nos. 28 and 36 of Houghton, Mifflin & Company's Riverside Literature series. These are bound together in cloth, and are as ornamental on the table as they are useful on the desk.

In our nature study we do not look at the anatomy or the physiology of the bird, any more than we consider the anatomy of our friend and next-door neighbor every time we pass him on the street. We know each species by its voice, the flutter of its wings, the home that it builds. We learn that one dress is worn during courtship, another when October winds warn of the southward flight.

Just as we study the birds so we study the bees, the butterflies, the bugs, and, going higher in the scale, all the animal life with which we are surrounded. In this we must always bear in mind

the relationship of the individual to its surroundings, its adaptability to environment and its economic province in the realm where nothing is useless and nothing insignificant.

PUSSY WILLOWS.



1. See the pret - ty pus - sy wil-lows, In their hous - es brown,
 2. You are wel-come, pus - sy wil-lows, In your silv' - ry gown,
 All the win-ter they've been sleep-ing In their beds of down.
 For your smiling, cheer - ful glanc - es, Ban - ish winter's frown.
 Now the warm spring sun-shine brightens Earth, and sea, and skies,
 Hark! I hear a blue - bird sing - ing, In his joyous flight,
 Soft - ly call - ing, "Wake, dear pussies! It is time to rise."
 And the cro - cus - es are springing Up - ward to the light.

PUSSY WILLOWS.

Pretty pussies down by the brook,
 Swinging away to and fro;
 On the bending willow boughs,
 Like pussy cats all in a row.

If I put you down by the fire,
 You pussies so cunning and shy,

I wonder if you'll turn
 Into pussy cats by and by?
 "Ah no!" the pussies said,
 "We couldn't and we wouldn't do that;
 We belong to fairy folk,
 And we are their pussy cats!"

Selected.

PUSSY WILLOW DAY.

DURING the Saturday morning walk along the river, Miss M's class discovered that the willows had put out their gray furry buds from the brown coverings, and were swaying lazily to and fro on the bending twigs. Ready hands soon gathered a large bunch, for the children knew well that Miss M. had been waiting some days for the willow buds to be brought in. Just a few days before she had said: "Children, we ought to have some pussy willows by this time." So all were on the lookout for them and felt sure that the day Miss M. had for the pussy willows would be of more than usual interest and pleasure.

Early Monday morning Miss M. had a pretty drawing of the

willow buds in one corner of the blackboard, and on the opposite board was a bunch of twigs, with veritable little pussy-cats climbing up the stems, tails, ears and paws complete, as if the furry little buds had turned into kittens in some mysterious way. Such funny little pussies too! Thoughtful, grave, gay, sleepy, mischievous, just ready to spring from their slender perch on some imaginary prey, and yet just enough like pussy willows to be recognized directly by the bright-eyed class of seven year olds assembled in Miss M's sunny room. The pussy willows from the river bank were in a tall, brown jar on the table, and after opening exercises, each child was given a branch with several soft buds on it and a nice sheet of paper, and were told to put on the paper just what they could see on their twig. Each one was busy at once making a drawing of their particular twig and buds. After the drawings were completed Miss M. collected them, that she might select some of the best to be colored at a subsequent lesson. For it was a rule in her school that no drawings could be colored that were not carefully and thoughtfully done.

Then the children all told of something they could see or knew of the willow twigs they held, and some of the good statements were written the blackboard for a reading lesson later in the day. One told of the way the buds grew on the stem, another of the color and the hard brown coverings of the buds that protected them all the cold winter. And another discovered that these were not like the buds of the horse-chestnut tree they had examined a few days before. By looking closely, the children were able to see the faint, yellow tinge underneath the grey, furry covering and discovered that they were looking at flower buds. When the children had finished their talk, Miss M. had a little story for them, that she said would be reproduced for a reading lesson, and she told them the story of Pussy Willow's Hood, which she had found in Miss Pratt's "Little Flower Folks."

All winter Pussy Willow had been shut up in her house by the brook, but one bright spring morning she opened the door and stepped out.

None of the flowers were up yet; the brook, the birds, the buds and a few grass blades were the only friends she saw.

"Why, whom have we here?" asked the Brook in surprise. "Mistress Pussy Willow, as I live. Good morning, Pussy, you are up bright and early, but why do you wear that fur hood? Summer is coming and every day grows warmer!"

"Oh, Mother Nature told me to keep it on, lest I get a toothache."

Everybody was glad to see Pussy. They all had something to

say to her, but they were all curious to know why she had on that fur hood. Poor Pussy! She was tempted to take it off, they all said so much about it; but she didn't.

To make matters worse, Mr. Robin whispered some sly things to Pussy's friends, and the next morning when Pussy came out, the birds, the buds, the grass and the brook began to shout, "Bald head, bald head, Pussy Willow has to wear a wig because she has no hair. Pussy Willow is a cheat."

Pussy felt very badly but all she said was, "Wait and see."

One morning after this, every one had a surprise. There was Pussy Willow with no fur hood on her head, but bright, golden curls dancing up and down in the breeze.

"Pussy is not a bald head. She has long, golden curls," cried all her friends, and mischief-making Mr. Robin went and hid his head for shame.

The story finished, Miss M. had the language class, copy and learn the Pussy Willow poem she had written on the blackboard; the arithmetic class had Pussy Willow problems and the geography class told the story of the river where the willows grew.

"Pussy Willow day is the nicest day we have had this spring," said Mollie as she bade her teacher good night.

LITERARY AND BIOGRAPHICAL.

THE EDUCATION OF WOMEN.

MABEL THURMAN, CLASS OF '95.

IN considering this subject we must not only trace the education of woman through the long centuries of the past, but we must likewise trace the advancement in the civilization of all humanity. For just in proportion as woman has been allowed to assert her individuality, and show that she possesses the same capacities as man, in such a ratio has education been made universal, thus raising the standard of society and advancing civilization.

What a strange and inconsistent idea it was that once found abode in the minds of mankind that only one half of society should receive the benefits of education! And what is so extremely inconsistent about it is that "man" should be the portion so highly favored. Why should woman, who is naturally so weak and needful of development, be deprived, while man, stronger and more vigorous, should have opened before him every channel for development and instruction?

What an inferior position throughout all ages woman has occupied! There have been but few exceptions, which we read of in either profane or sacred history. For example, Vashti, Queen

Esther, and Hypatia appear as bright stars in the darkened firmament of those early ages when woman's sphere was one of obscurity, ignorance, and passive obedience to the tyrannical mandates of man.

First let us consider the position which she occupied in the ancient civilization of the orient. If she happened to be beautiful she was a splendid article of merchandise. Even if she were not beautiful, but strong and robust and able to perform hard labor, the price was not so bad. But alas! if she were neither beautiful nor robust her plight was indeed pitiable. Of what did her education consist? If it were the will of her lord and master she would learn to sing and dance; but her accomplishments were all simply the result of his caprice. To minister to his selfish wants was her life's labor. As a daughter of the poor, her employment was menial and servile; as a daughter of the rich, her position was only another phase of slavery.

Among the Jews, the condition was somewhat better. Here woman was the mother, not in the sense of motherhood in India, China, Egypt, and Persia, but in its true sense—the helpmeet and honored wife, a respected member of society, the trainer of her children. Was it not a divine command that the mothers of Israel should be the preceptors of their sons and daughters? What a sweet and touching picture is presented in a Jewish home! The mother, seated upon the housetop, with her children round her knee looking up into her face, while she tells them the stories of their father, or reads to them from the "Talmud!"

What is the womanhood of Greece? Only generations of the purest culture could produce such beauty of form and feature, such grace, such exquisite song and poetry as we read of in the Grecian woman. The great Solon said that the "music of the spheres" was not more divine than the voice of Sappho.

Plato in his "Republic" makes more generous provision for the education of woman than had ever previous to that time been conceived of. Since she was of equal importance in the maintenance of the state, she should be developed physically and intellectually. But this idea of Plato's concerning woman fails to excite our highest admiration. True he allows her equal advantages with man, but her ideas, her actions, her occupations, and her emotions must be the same as man's. Thus would he stifle those finer and more tender sensibilities which make her most charming as a woman. But then his scheme was simply ideal after all. We ought indeed to be grateful that it was so, else today we could not look upon the Grecian woman as the type of ideal grace and beauty. But even here her position was servile.

True, she was more accomplished, more highly cultured than the women of other nations, but was not the Grecian himself more accomplished, more highly cultured than other men? Possessing such aesthetic tendencies, it would certainly be out of keeping with her nature should the Grecian woman be as other women. In beautiful Greece then her culture was likewise simply the result of man's caprice.

There was a difference between the Athenian and the Spartan ideal woman. In Sparta it was not the goddess of beauty, poetry, and music, but the patriot, the woman who in the one absorbing thought, my country, could forget all other affections and emotions; who could say joyfully to her sons, "Go, fight, and if need be, die for your country, as did the Spartan sons at Thermopylæ."

In Rome what was the status of woman? When mothers had the training of their sons, when wives were the companions of their husbands, when the home affections were held sacred, then Rome was prosperous, pure, patriotic. But when luxury succeeded simple prosperity; when mothers forgot their duties to their children and entrusted them to the care of slaves; when her own education was neglected and her individuality as a member of society lost in blind submission to vice—then the great empire fell. When Rome could boast of her Cornelias, she could likewise boast of her Gracchi; but when a Nero personified her patriotism, her mothers had long ceased to consider children their most precious jewels.

Among the early Christians the ideal of woman was again changed. She no longer received that education which fitted her to be an ornament and a toy of the earth, but such an education as would, according to the ideas of the early fathers, prepare her to be the bride of heaven. No longer the worldly woman, accomplished and aesthetic, but the secluded nun, ignorant and ascetic. To despise everything earthly, and live a life of devotion, to read the Bible, her only accomplishment—such was the type of early Christian womanhood. Saint Jerome in his treatise on the Education of Girls, not only proscribes music, letters, the arts and sciences, but even goes so far as to condemn the most honorable sentiments of the heart. "The heart is human also, and everything human is full of danger and must be subdued. Do not allow Paula to feel more affection for one companion than for another, and to such an one do not allow her to speak in an undertone." Such is his advice as given to the mother of his pupil.

Such asceticism, however, was too rigid to last forever, and even so early as Saint Basil's day a more liberal spirit began to creep

into the education of both sexes. Some few of the classics are recommended, and even music is not so despised. Further along in the middle ages the condition is gradually improving, and in 800 A. D., with the first Renaissance one of the most striking features is, that not only the sons of Charlemagne, but his daughters as well, are permitted to attend the Palace School and receive instructions from the great Alcuin. This condition, however, is only among the nobility. The peasant woman still continues in her servile position.

How different is the position occupied by the lady of the castle! In the days of chivalry how exalted is her position! Truly "the knight's best boast was but to wear a lock of his fair lady's hair." Then she was almost worshiped, not because she was deemed the equal of man intellectually, but because those were the days of chivalry. It was the cavalier's pleasure to see his lady accomplished in all the feminine arts. This, at least, is one step farther in the education of woman, one step farther in the advancement of civilization.

With Erasmus, who marks the transition from the humanistic to the realistic idea, female education makes a great stride. Do the women of modern times appreciate this first great innovator's work? Do they realize that to Erasmus they owe their eternal gratitude? Has a monument been erected to his memory proclaiming him the emancipator of one half of society? This was truly his great mission. All honor to Erasmus, the first educator of modern times to grant women the privilege of equal instruction with men, the first to fully realize and express the true relationship of the mother to the early education of the child!

Montaigne is perhaps the only educator of eminence who held women in utter contempt. He would "keep her in ignorance, on the pretext that culture would mar her natural charms." And, strange to say, this most erroneous idea was not entertained by Montaigne alone. Sadly must it be confessed that until very recent times it has had a great share in corrupting the minds of society regarding female education.

But on the other hand there is much of which we may be justly proud. The greatest minds in all ages, the boldest innovators in education, philosophers of the highest type, and the great reformers have ever recognized this idea, that woman forms the one half of society, and that the whole cannot be harmoniously developed unless both parts realize equal advantages.

With Comenius this idea was held as most important. One of his fundamental principles relates to this very subject: "Since the end of education is individual development, both sexes should

receive equal instruction." And woman has certainly never had a greater champion than Fenelon. He, perhaps, expresses himself on this subject more strongly than any other. He even gives to her the preference, since "she is weaker and more needful of development."

Until the seventeenth century woman had only proven her ability to *receive* instruction, but now she appears upon the great scene as an educator herself. It is said that a great man is known by his disciples. Madam de Maintenon and Madam de Levis were truly the disciples of Fenelon. They in turn had their disciples, not only in France, but in other nations of Europe. When, since the days of Sappho and her train, had the intellects of women been so brilliant, so dazzling as in the first period of the school of Saint Cyr? Strange it is, but the path of pedagogy is ever zig-zag. Thus in the education of women the one extreme must follow the other. The pious, dull, patient, submissive housewife was succeeded by the fascinating, entertaining, witty and irreligious lady of the court.

Must we not recognize in Madam de Maintenon, the psychologist? Only from a profound knowledge of the human mind, and of woman's nature in particular, could the great change which was wrought at Saint Cyr have been accomplished. In her second period the happy medium was reached. Although this period is noted less for its brilliancy, there is an influence around it less superficial, more serious and profound.

Through "Leonard and Gertrude" Pestalozzi became a teacher to all people. "Gertrude" the central and ideal figure, is the mother who trains her children. Thus would Pestalozzi place the instruction and education of the people in the hands of mothers.

A comparison of woman's intellect with that of man's has been a subject of frequent discussion. Is it inferior? Some have arrived at a conclusion that it is so. True, there is a difference. But can this difference be called "inferiority?" With what perfect justness has Madam de Remusat described the feminine mind! "Endowed with a quick intelligence we hear promptly, we even divine and see just as well as men; but too easily moved to remain impartial, too mobile to be profound, perceiving is easier for us than observing. Prolonged attention wearies us; we are, in short, more mild than patient. More sensitive, and more devoted than men, our very faults are the outgrowths of our conditions."

Her reflections are even of a philosophical character. Her chapters on conscience as a moral rule are worthy of note. With this lady other women educators of the eighteenth century should

be mentioned as Miss Edgeworth, Miss Hamilton, Madam de Genles, and Madam Pape Carpentier.

What is the condition of woman in our own century? But first, what is the condition of civilization in general? Where are our heroes, educators, philosophers? The nations are composed of them. Never before has there existed such a glorious civilization. Never before has woman been held in such esteem. Every science and every art is open for her investigation. As doctors, lawyers, divines, architects—in almost every vocation of life is she to be found. What surprise, perhaps regret, would illumine the faces of the fathers of two centuries ago could they but see the brilliant, independent woman who has evolved from the quiet, unassuming housewife of their acquaintance!

With what sarcasm does Herbert Spencer speak of the mother who is unacquainted with the child's mind, who does not understand its capacities and their order of development! She should likewise understand the child's physical needs and the best method for supplying them. Thus, before she is worthy to become a mother, she should be a psychologist, a physiologist.

Even in our own state this subject of the rights of woman is being greatly agitated. What will the result be? Her educational rights she has already received. She has certainly proven herself worthy of them. Will her political rights be granted? Madam de Remusat has said that the destiny of woman is comprised in these two terms—the mother of a citizen. If indeed this be true, should she not receive the franchise? For in the application of her political knowledge she would be more capable to teach and instruct those future citizens entrusted to her care.

But aside from her rights and duties as a mother, should she not from her own merit and worthiness be entitled to the right of suffrage? Is she not of as great importance to her country as man? Is she not as much a member of society as man? Will not her advancement in every direction ensure a more rapid advancement of the race?

TEACHER: "Johnnie where is the north pole?" Johnnie: "I don't know." Teacher: "Don't know where the north pole is?" Jonnie: When Doctor Kane and Franklin and Greely hunted for it and couldn't find it, how am I to know where it is?"

MANY a man who is a good shot in this world wishes to miss fire in the next.

NOTES.

EDUCATIONAL.

The Harvard Faculty have decided that as an intercollegiate game foot-ball shall be kicked out.

Supt. Millspaugh, of Salt Lake City, lately attended the Convention of Superintendents at Cleveland. At a recent meeting of the teachers of Salt Lake City he delivered an address upon the different schools and school-work that had come under his observation during his recent visit in the east.

A young schoolmaster of Illinois is suing a fair but fickle maiden for \$10,000 damages which he claims his heart has suffered on her account. We wouldn't give ten cents on the dollar for his chances. Women have some rights which no jury in the world could deny them and one which they hold most dear and which they do not propose to surrender is the right to change their minds.

The *Ohio Teacher* says: "We often send out a hundred statements to subscribers (of amount due) and never hear from more than ten or a dozen of them!" Are these the persons upon whom the world relies for bringing up the children that honesty may abound? Such persons (as don't reply) are not even honest citizens, much less decent teachers! The teacher should be the justest person in the world towards his educational paper.

In one of the towns in the southern part of the Territory a public school meeting was called to consider the advisability of taxing the community for more and better furniture for their school-houses; but so little interest was taken that there were scarcely enough persons present to hold meeting. People seem slow in realizing the necessity of well furnishing their schoolrooms. If they knew how much the progress of their children depends upon the equipment of the school and the necessity of obtaining good teachers, we feel sure they would be more exercised in matters pertaining to the schools of their districts.

It is one thing to be qualified to make scholars, but quite another to be qualified to make men. Prof. James of Philadelphia, recently said that most of the teaching in our higher schools is of an exceedingly low grade; in other words, these schools are graduating scholars, but not educating men. He also says that he remembers distinctly the sensation of disappointment, almost of disgust, which he experienced on entering Harvard College, to find that the average instructor and professor with whom he came in contact, was so decidedly inferior in teaching ability to the masters whom he had known in the preparatory school. This means that teaching in the lower schools is averaging better than teaching in higher schools. A great deal has been done during the past twenty years for the education of primary and intermediate teachers, but almost nothing for the training of college and theological professors. Reform in this instance is slowly coming from below above, and it would not be strange if the primary teachers should yet convert the college tutors.

The Teachers' Institute.

BRIGHAM YOUNG ACADEMY.

The class of 1900 is in a prosperous condition. There seems to be a growing feeling among its members for all to continue in school until graduation.

1st. Gentleman—Well, friend, did you enjoy the play last evening?

2nd. Gentleman—No, there was a lady sitting behind me who had seen it before.

The president of the Class of '96, says the class is in good condition, though they feel the loss of their vice-president, Mr. Earnest Cornwall, who has discontinued school.

On entering room X a few days ago a teacher of Geometry saw placed artistically upon the black-board. "What is Geometry? It is the science of telling the truth under difficulties."

We regret to see so many of the students dropping out of school, but are pleased to note that, with very few exceptions, they leave early this year that they may join us again at the opening of the next school year.

Hon. J. W. N. Whitecotton lectured before the Polysophical Society Friday evening, March 22nd, on "The Problem of Life." The lecture was a very interesting and instructive one and was listened to with rapt attention.

One of the books received at the Book Concert, Saturday evening, March 30, was a text-book of English Literature which is 156 years old. The Academy realized from the concert 130 choice volumes on literary and scientific subjects.

The male students of the academy turned out in mass, assisted by the good people of Provo, Saturday, March 23rd, to fix up the grounds preparatory to planting lawns. Though not completed, the work that has been done adds largely to the appearance of the campus. While the sterner sex were out blistering their "jily white hands" and getting color in their cheeks, the lady students were busily engaged preparing a feast in the Academy halls. The affair was an entire success. That's right, fellow students! Let us keep up the good work until the grounds will be a credit to our school and we can look with *greater* pride upon our Alma Mater.

How little we dream of the doom that awaits us upon entering the Academy! A few short months ago these two young people, Mr. T. J. Yates and Miss Lydia Horne, entered the Academy intending to do a year's hard study; but they thought their burdens too heavy to carry alone, so Mr. Yates put his scientific head to work and solved the problem that, union of power is economy of strength. Miss Horne, always willing to concede to truth, accepted his (Mr. Yates') proposition. They were married March 20 last, in Salt Lake City. We wish Mr. and Mrs. Yates all the joy and happiness they can desire.

Prof. W. E. Rydalch, of the Brigham Young Academy, has been delivering a series of popular Sunday evening lectures in Springville, which are evidently appreciated, judging by this clipping from the *Springville Independent*. "The lecture by Prof. Rydalch in the Meeting House, Sunday evening, on the subject, 'Religion and Science,' was one of the most interesting addresses given this winter. The Professor proved to the satisfaction of his listeners, that the sciences of botany, geology and astronomy, gave certain and undeniable proofs of the existence of a Supreme being, and of a spiritual sphere, removed beyond our present state of action. The building was filled with attentive listeners, and we believe the lecture could be repeated with a crowded house to greet Mr. Rydalch."

To the Journal of Pedagogy:

I have read with much interest the articles published in each issue of the JOURNAL. They are filled with thought and timely suggestions for the progressive teacher. Taking its infancy as a criterion, I am safe in predicting for the JOURNAL OF PEDAGOGY a bright and useful future and in saying that it will soon take a place alongside the best publications in our land. It deserves the unqualified support of every Utah teacher.

Very truly,

D. H. CHRISTENSEN,

Supt. Public School, Utah Co.

I have received your recent circular in reference to the JOURNAL OF PEDAGOGY, and shall take great pleasure in calling the attention of our teachers to it. I think it does you and Utah credit.

Respectfully,

J. F. MILLSPAUGH,

Supt. Public Schools, Salt Lake City.

I have looked carefully over your copies of the JOURNAL and find them interesting and profitable. They will certainly prove helpful to teachers who read them carefully and intelligently.

Respectfully,

R. S. PAGE.

To the Journal of Pedagogy:

I have carefully examined the JOURNAL OF PEDAGOGY and am pleased with the spirit of it and with the matter therein contained. I shall present the matter at our next Teacher's Institute, and recommend the sustaining of a home product in our line. I am

Truly yours,

SAMUEL OLDHAM,

Supt. Schools, Cache Co.

FROM THE AGRICULTURAL COLLEGE.

Sophomores in shopwork are now engaged in pattern-making. Last term they had machine work in metal.

The Freshman class in ironwork has just finished the work of the first year in iron. Twenty-four power-blast forges have been running two shifts daily for eleven weeks. All the ordinary operations of blacksmithing have been learned; and piles of tools, chains and ornaments of iron now bear witness to the skill of the workers in iron. Bench-work in wood will be resumed for the remainder of the year.

President Paul and Professors Mills, Richman, and Linfield, have been busy for a month past in organizing Agricultural Societies in all parts of this county. About five hundred farmers have already joined. The three professors named, are practical and scientific agriculturists and their timely lectures on cattle feeding, fruit growing and dairying, have aroused interest and enthusiasm throughout the entire county.

The College band, under the leadership of Mr. R. L. Sweeten, is now one of the best bands in the county. The band serenaded the leading houses of Logan a few days ago, and received the hearty thanks and compliments of many of our foremost citizens. The band is a great aid to the military organization, and Mr. Sweeten's work is much appreciated by both students and teachers.

The last military ball given by the students was a very successful affair. Numerous uniforms give a military aspect to the company, and several of the young ladies were somewhat proud to state that the dresses they wore were the workmanship of their own hands, made in the dress-making class, working one hour a day, under Mrs. MacEwan.

Mrs. MacEwan has retired from her position at the College. She was a very skillful teacher, an accomplished scholar, and a true lady. She has been succeeded by Miss Sarah Bowen of Logan, a talented, prepossessing and dignified lady of much ability and experience in this line of work.

The ladies of the College gave a grand ball a short time since, in the gymnasium, which was crowded to its utmost capacity. Many people from Ogden and Brigham City were present. The Committee cleared \$40, which will be used in the purchase of additional small rifles for ladies' military tactics. The exhibition of tactics given during the ball by the ladies' military company in the College uniform was a creditable piece of precise, artistic work, and called forth thunders of applause.

The class in elementary botany begins on Tuesday, March 19th, and will continue one term. About thirty students will take this study, which includes the analysis of the native wild flowers and the collection of a herbarium. A special feature of the work this year is the preparation of natural size drawings by each student showing the wood branches, leaves, buds, flower structure, and fruit of at least one native forest tree. The class is under Prof. Richman, who is a practical horticulturist and florist as well as botanist. The drawing of the botanical plates is in charge of Mr. Schaub, an artist of superior ability. For this part of the work the College library contains, among other valuable aids, seven large volumes on the Sylva of North America—the finest works on botany ever published, costing \$25 per volume. Botany will be a leading study in the college in the future. Advanced courses in structural and economic botany will be given, in addition to the courses in horticulture.

The class in Veterinary Science, has just finished the dissection of the second horse. The veterinary dissecting rooms have resembled a butcher shop during the whole winter; now, with the fumes of carbolic acid and other disinfectants they are like a chemical factory. Prof. Twombly, in charge, is a practical veterinarian.

The students in cooking at the close of the winter term's work, presented Mrs. Cotey professor of Domestic Arts, a beautiful silver tray lined with gold and in the shape of a double heart. This class has undertaken and completed some highly scientific work this year. Lunches for from ten to thirty guests have been served each day, at a cost of fifteen cents per lunch. These lunches were really first-class dinners, perfect in appointment, and altogether satisfactory in the delicacy and style of the cooking and in the methods of serving. Curiously enough, these fine lunches paid for themselves—a lesson in economy to all homekeepers. Scientific cooking and the art of tasteful serving are indeed rare accomplishments. Indigestion is the cause of more irreligion and misery than is atheism or drunkenness. As Owen Meredith says:

We may live without poetry, music, and art;
 We may live without conscience and live without heart;
 We may live without friends, we may live without books,
 But civilized man cannot live without cooks.
 He may live without books—what is knowledge but grieving?
 He may live without hope—what is hope but deceiving?
 He may live without love—what is passion but pining?
 But where is the man that can live without dining?

Dr. Brewer's biologists and zoologists are greatly taken up with the microscopic examination of living bacteria. They cultivate these infinitesimal creatures in broods of thousands in small glass tubes, feeding them on gelatin and beef broth. The two biological laboratories are lined with rows of tubes containing these cultures, innocent enough to look at, but containing the possibilities of life or death for millions of the human family. A recent outbreak of a fatal sickness among the hogs at Smithfield has been investigated by the students. Some blood from near the heart was taken from one dying animal and cultivated for bacteria. There developed in a few days thousands of the microscopic bacilli which cause the fatal disease known as the hog cholera—a plague from which Utah hog raisers thought we were free. The presence of tuberculosis and fanders in Utah animals has been proved in the same way by Drs. Brewer & Twombly.

The newspapers of the Territory and the leading periodicals of the country are to be found in the reading room. Recently by exchange of the publications of the Experiment Station, about seventy-five of the best agricultural papers of the United States and Europe, have been added to the current library, making it the best library on agriculture and allied sciences in the Western region. It is open to the public. The publications of the Experiment Station reach every state in the Union and every continent on the globe, and are extensively quoted by the leading farm journals. These publications are sent free to any person requesting them. Every teacher in Utah should send for a copy of the last Report so as to know what the Utah Station is doing. Agriculture will soon be taught in the western and common schools. Teachers should keep in touch with this greatest of all sciences.

The class in mineralogy has just finished the study of all the important minerals having in their composition gold, silver, lead, copper, tin, iron or mercury. The study of the silicate and the soil-forming rocks will occupy the class for the remainder of the course. The recent rearrangement and cataloguing of the mineral collection will facilitate the work of the students.

The members of the class, in connection with the regular work in assaying, have made, during the last three weeks, more than fifty assays of samples sent to the college from all parts of the territory, Montana, Idaho, Wyoming, Colorado and Oregon. A piece of quartzose rock from a Montana prospect assayed \$1,200.00 in gold and 75 ounces of silver to the ton. Another, from Beaver County, went \$1,045.00 in gold and 30 ounces of silver.

The mineralogical laboratory has frequent visits from practical miners. They are usually much interested in the simple and rapid methods used by the students to determine the composition of minerals.